PB-240 340

SCHROON LAKE, ESSEX AND WARREN COUNTIES, NEW YORK

Pacific Northwest Environmental Research Laboratory

Prepared for:

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New York State Department of Environmental Conservation

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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivded according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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REPORT

ON

SCHROON LAKE

ESSEX AND WARREN COUNTIES

NEW YORK

EPA REGION II

WORKING PAPER No. 169

WITH THE COOPERATION OF THE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AND THE

NEW YORK NATIONAL GUARD

NOVEMBER, 1974

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the New York Department of Environmental Conservation for professional involvement and to the New York National Guard for conducting the tributary sampling phase of the Survey.

Henry L. Diamond, Commissioner of the New York Department of Environmental Conservation, and Leo J. Hetling, Director, and Italo G. Carcich, Senior Sanitary Engineer, Environmental Quality Research, Department of Environmental Conservation, provided invaluable lake documentation and counsel during the Survey.

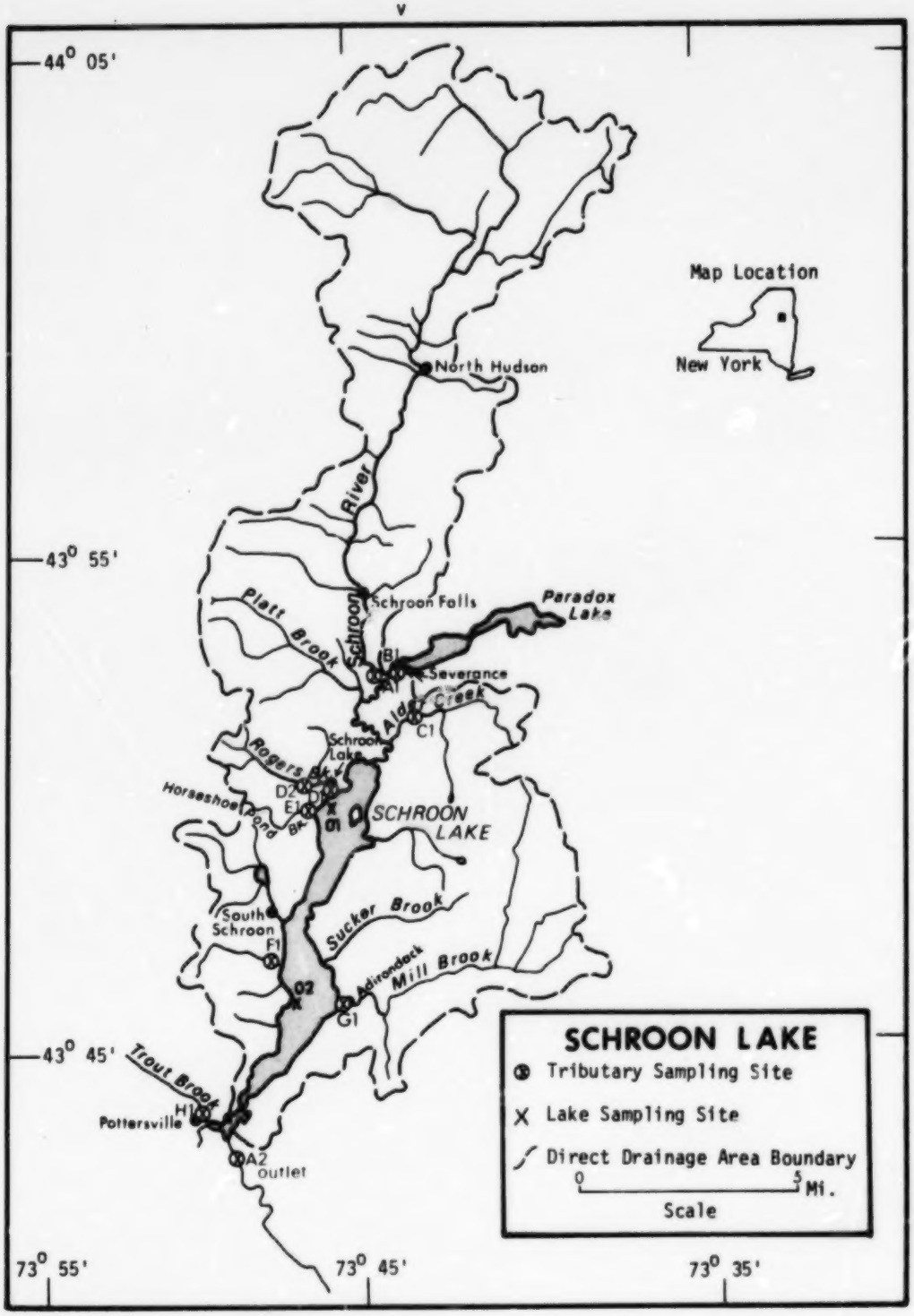
Major General John C. Baker, the Adjutant General of New York, and Project Officer Lieutenant Colonel Fred Peters, who directed the volunteer efforts of the New York National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF NEW YORK

LAKE NAME	COUNTY
Allegheny Reservoir	Cattaraugas, NY; McLean, Warren, PA
Black	St. Lawrence
Canandaigua	Ontario
Cannonsville	Delaware
Carry Falls	St. Lawrence
Cassadaga	Chautauqua
Cayuga	Seneca, Tompkins
Champlain	Clinton, Essex, NY; Addison, Chittenden, Franklin, VT
Chautauqua	Chautauqua
Conesus	Livingston
Cross	Cayuga, Onondaga
Goodyear	Otsego
Huntington	Sullivan
Keuka	Ontario
Long	Hamilton
Lower St. Regis	Franklin
Otter	Cayuga
Owasco	Cayuga
Raquette Pond	Franklin
Round	Saratoga
Sacandaga Res.	Fulton, Saratoga
Saratoga	Saratoga
Schroon	Essex, Warren
Seneca	Seneca, Schyler, Yates
Swan	Sullivan
Swinging Bridge Res.	Sullivan


44° 05'
43° 55'
43° 45'
73° 55'
73° 45'
73° 35'
Map Location
New York
North Hudson
Schroon River
Platt Brook
Schroon Falls
Paradox Lake
Severance
Alder Creek
Schroon Lake
Rogers Brook
Horseshoe Pond Brook
SCHROON LAKE
South Schroon
Sucker Brook
Adirondack
Mill Brook
Trout Brook
Pottersville
outlet
SCHROON LAKE
Tributary Sampling Site
Lake Sampling Site
Direct Drainage Area Boundary
0
5
Mi.
Scale

SCHROON LAKE

STORET NO. 3634

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Schroon Lake is oligotrophic. Of the 26 New York lakes studied, none had lower mean total phosphorus, only one had less mean inorganic nitrogen, and none had less mean chlorophyll a.

Survey limnologists noted that Schroon Lake exhibited high clarity and was clear of algal blooms at all sampling times.

B. Rate-Limiting Nutrient:

Algal assay results show that Schroon Lake was phosphorus limited at the time the assay sample was collected. The lake data also indicate phosphorus limitation at all sampling times (N/P ratios were greater than 36/1, and phosphorus limitation would be expected).

C. Nutrient Controllability:

1. Point sources--It is estimated that point sources accounted for only 3% of the total phosphorus load to Schroon Lake during the sampling year. The calculated input phosphorus loading rate was less than that proposed by Vollenweider (in press) as "permissible" (i.e., an oligotrophic rate--see page 13); and it might be concluded that point-source control of phosphorus would have little

effect on the trophic condition of the lake. However, during the sampling year some 17,800 pounds more phosphorus and 260,500 pounds more nitrogen were measured leaving the lake than can be accounted for by all measured and estimated inputs. While nitrogen loss can occur under certain conditions, with losses of both primary nutrients at the indicated magnitude, it is most probable that unknown and unmeasured direct-discharge nutrient inputs were the cause of the imbalance.

Now, if the amount of phosphorus measured leaving the lake was equivalent to the sum of the actual inputs, then Schroon Lake received a phosphorus load at a rate of 7.8 lbs/acre/yr or 0.88 g/m^2/yr. This rate is well above the oligotrophic rate of 0.56 g/m^2/yr and, if continued, would affect the existing trophic condition of the lake.

It is apparent that a more detailed study of Schroon Lake nutrient sources is needed to provide a basis for assessment of nutrient controllability.

2. Non-point sources (see page 13)--The phosphorus exports of the Schroon Lake tributar - were relatively low and compare well with the exports of unimpacted tributaries studied elsewhere in New York (e.g., Sacandaga Reservoir tributaries*).

In all, it is estimated that non-point sources contributed 97% of the total phosphorus load to Schroon Lake during the sampling year.

* Working Paper No. 167.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry†:

1. Surface area: 4,128 acres.
2. Mean depth: 47 feet.
3. Maximum depth: 152 feet.
4. Volume: 194,016 acre/feet.
5. Mean hydraulic retention time: 153 days.

B. Tributary and Outlet:
(See Appendix A for flow data)

1. Tributaries -

Name	Drainage area*	Mean flow*
Schroon River	173.0 mi^2	257.6 cfs
Rogers Brook	8.7 mi^2	13.0 cfs
Horseshoe Pond Brook	2.5 mi^2	3.7 cfs
Unnamed Brook (F-1)	2.5 mi^2	3.7 cfs
Mill Brook	24.7 mi^2	36.8 cfs
Minor tributaries & immediate drainage -	214.2 mi^2	328.1 cfs
Totals	425.6 mi^2	642.9 cfs

2. Outlet -

Schroon River	432.0 mi^2**	640.8 cfs

C. Precipitation***:

1. Year of sampling: 38.5 inches.
2. Mean annual: 37.4 inches.

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† Aulenbach, 1973.
* Drainage areas are accurate within ±5%, except for small basins (±10%); mean daily flows are accurate within ±5 to 25%; and normalized mean monthly flows are accurate within ±15%.
** Includes area of lake.
*** See Working Paper No. 1, "Survey Methods".

III. LAKE WATER QUALITY SUMMARY

Schroon Lake was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two stations on the lake and from a number of depths at each station (see map, page v). During each visit a single depth-integrated (15 feet or near bottom to surface) sample was collected from the two stations for phytoplankton identification and enumeration; and during the last visit, a single five-gallon depth-integrated sample was collected for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 41 feet at station 1 and 32 feet at station 2.

The results obtained are presented in full in Appendix B, and the data for the fall sampling period, when the lake was essentially well-mixed, are summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

Parameter	Minimum	Mean	Median	Maximum
		FALL VALUES (10/10/72)		
Temperature (Cent.)	7.8	12.4	13.5	13.8
Dissolved oxygen (mg/l)	7.1	8.6	9.0	9.1
Conductivity (μmhos)	57	59	59	60
pH (units)	6.6	7.1	7.1	7.2
Alkalinity (mg/l)	10.0	10.0	10.0	11.0
Total P (mg/l)	0.003	0.004	0.004	0.007
Dissolved P (mg/l)	0.001	0.003	0.003	0.005
NO_2 + NO_3 (mg/l)	0.080	0.114	0.090	0.220
Ammonia (mg/l)	0.030	0.046	0.040	0.070
		ALL VALUES		
Secchi disc (inches)	118	147	142	180

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Number per ml
06/01/72	1. Dinobryon	219
	2. Cyclotella	132
	3. Fragilaria	70
	4. Achnanthes	27
	5. Mallomonas	14
	Other genera	55
	Total	517
07/25/72	1. Microcystis	76
	2. Chroococcus	60
	3. Flagellates	45
	4. Dinobryon	34
	5. Merismopedia	31
	Other genera	157
	Total	403
10/10/72	1. Dinobryon	163
	2. Flagellates	139
	3. Aphanocapsa	127
	4. Fragilaria	87
	5. Tabellaria	78
	Other genera	223
	Total	817

2. Chlorophyll *a* -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
06/01/72	01	1.9
	02	1.9
07/25/72	01	1.8
	02	2.9
10/10/72	01	2.1
	02	1.9

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)	N/P Ratio
Control	0.004	0.062	0.1	16/1
0.010 P	0.014	0.062	0.3	4/1
0.020 P	0.024	0.062	0.5	
0.050 P	0.054	0.062	0.4	
0.050 P + 5.0 N	0.054	5.062	13.9	
0.050 P + 10.0 N	0.054	10.062	14.3	
10.0 N	0.004	10.062	0.1	

2. Discussion -

The control yield of the assay alga, *Selenastrum capricornutum*, indicates that the potential primary productivity of Schroon Lake was very low at the time the assay sample was collected as were the levels of primary nutrients (there was some loss of inorganic nitrogen in the assay sample from the time of collection until the assay was begun; however, the results would not have differed significantly had the loss not occurred).

The N/P ratio of the control sample, and the lack of response to the nitrogen only spike, show that the control sample was phosphorus limited. However, the first phosphorus spike of only 10 µg/l more than tripled the orthophosphorus concentration in the sample and nitrogen became limiting, so there was no signficant yield response to increments of phosphorus (note the N/P ratio after the first addition of phosphorus). Because of the very low levels of both nutrients, the sample essentially was co-limited, and the only significant yield response occurred when both nitrogen and phosphorus were added.

The lake data indicate phosphorus limitation at all sampling times; i.e., the N/P ratios were 36/1 or greater, and phosphorus limitation would be expected.

IV. NUTRIENT LOADINGS
(See Appendix C for data)

For the determination of nutrient loadings, the New York National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of April and May when two samples were collected. Sampling began in November, 1972, and was completed in October, 1973.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the New York District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

Except for Rogers Brook, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings†. Because of the possible effect of septic tank discharges on the nutrient concentrations measured in Rogers Brook at station D-1, the nutrient loads for this stream were calculated using the mean concentrations at station D-2 and the mean flow at station D-1.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated by using the means of the nutrient loads, in $lbs/mi^2/year$, at stations E-1, F-1, and G-1 and multiplying the means by the ZZ area in mi^2.

† See Working Paper No. 1.

During the sampling year, the City of Schroon Lake was served by septic tanks, and estimates of nutrient loadings are based on a population served of 150*. It is assumed that all of these nutrients reached the lake. A new wastewater treatment facility was expected to begin operation by the summer of 1973**.

A. Waste Sources:

1. Known municipal* -

Name	Pop. Served	Treatment	Mean Flow (mgd)	Receiving Water
Schroon Lake	150	Septic tanks	?	Rogers Brook

2. Known industrial - None

* Anonymous, 1971.
** Aulenbach, 1973.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
Schroon River	4,980	34.5
Rogers Brook	380	2.6
Horseshoe Pond Brook	80	0.6
Unnamed Brook (F-1)	70	0.5
Mill Brook	910	6.3
b. Minor tributaries & immediate drainage (non-point load) -	6,930	48.1
c. Known municipal - None	-	-
d. Septic tanks* -	430	3.0
e. Known industrial - None	-	-
f. Direct precipitation** -	640	4.4
Total	14,420	100.0

2. Outputs -

Lake outlet - Schroon River 32,290

3. Net annual P loss - 17,870 pounds

* Estimate based on that portion of the City of Schroon Lake population served by septic tanks (150) and 627 shoreline dwellings (U.S.G.S. map, 1953); see Working Paper No. 1.
** See Working Paper No. 1.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	lbs N/ yr	% of total
a. Tributaries (non-point load) -		
Schroon River	556,640	41.3
Rogers Brook	28,410	1.6
Horseshoe Pond Brook	6,090	0.5
Unnamed Brook (F-1)	5,930	0.4
Mill Brook	91,470	6.8
b. Minor tributaries & immediate drainage (non-point load) -	610,470	45.3
c. Known municipal - None	-	-
d. Septic tanks* -	16,150	1.2
e. Known industrial - None	-	-
f. Direct precipitation** -	39,770	2.9
Total	1,354,930	100.0

2. Outputs -

Lake outlet - Schroon River 1,615,440

3. Net annual N loss - 260,510 pounds

* Estimate based on that portion of the City of Schroon Lake population served by septic tanks (150) and 627 shoreline dwellings (U.S.G.S. map, 1953); see Working Paper No. 1.
** See Working Paper No. 1.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr
Schroon River	29	3,218
Rogers Brook	44	3,266
Horseshoe Pond Brook	32	2,456
Unnamed Brook (F-1)	28	2,391
Mill Brook	37	3,703

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (in press). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous and "permissible".

	Total Phosphorus		Total Nitrogen	
Units	Total	Accumulated	Total	Accumulated
lbs/acre/yr	3.5	loss*	328.2	loss*
grams/m^2/yr	0.39	-	36.8	-

Vollenweider loading rates for phosphorus (g/m^2/yr) based on mean depth and mean hydraulic retention time of Schroon Lake:

"Dangerous" (eutrophic rate)	1.12
"Permissible" (oligotrophic rate)	0.56

* An apparent loss of some 17,870 lbs of total phosphorus and 260,510 lbs of total nitrogen occurred during the sampling year. While nitrogen loss can occur with certain conditions, losses of both nutrients at that magnitude makes it almost certain that unknown and unmeasured nutrient inputs were involved.

V. LITERATURE REVIEWED

Anonymous, 1971. Inventory of municipal waste facilities. Publ. No. OWP-1, Vol. 2, EPA, Washington, D.C.

Aulenbach, Donald B., 1973. National Eutrophication Survey questionnaire. Rensselaer Polytechnic Inst., Troy.

Vollenweider, Richard A. (in press). Input-output models. Schweiz. A. Hydrol.

VII. APPENDICES

APPENDIX A

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR NEW YORK 11/26/74

LAKE CODE 3634 SCHROON LAKE

TOTAL DRAINAGE AREA OF LAKE 432.00

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
3634A1	173.00	181.00	170.00	319.00	888.00	509.00	244.00	119.00	70.90	79.20	119.00	191.00	204.00	257.55
3634A2	432.00	459.00	398.00	810.00	2180.00	1290.00	599.00	301.00	180.00	195.00	302.00	470.00	518.00	640.82
3634D1	8.72	9.11	8.58	16.10	44.80	25.70	12.10	5.97	3.57	3.99	5.99	9.63	10.30	12.99
3634E1	2.48	2.59	2.44	4.57	12.70	7.30	3.49	1.70	1.02	1.14	1.70	2.74	2.92	3.69
3634F1	2.48	2.59	2.44	4.57	12.70	7.30	3.49	1.70	1.02	1.14	1.70	2.74	2.92	3.69
3634G1	24.70	25.80	24.30	45.50	127.00	72.70	34.80	16.90	10.10	11.30	17.10	27.30	29.10	36.78
3634Z7	220.62	230.00	217.00	406.00	1130.00	649.00	311.00	151.00	90.50	101.00	152.00	244.00	260.00	328.08

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 432.00
SUM OF SUB-DRAINAGE AREAS = 432.00

TOTAL FLOW IN = 7722.15
TOTAL FLOW OUT = 7694.00

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
3634A1	11	72	276.00	5	908.00				
	12	72	218.00	3	458.00				
	1	73	348.00	7	600.00				
	2	73	315.00	25	200.00				
	3	73	845.00						
	4	73	884.00	8	830.00	23	1440.00		
	5	73	540.00	6	452.00	26	655.00		
	6	73	247.00	9	312.00				
	7	73	168.00	10	190.00				
	8	73	62.70	3	206.00	31	72.50		
	9	73	72.70						
	10	73	45.00						
3634A2	11	72	1190.00						
	12	72	711.00						
	1	73	1010.00	7	882.00	28	1170.00		
	2	73	684.00	25	574.00				
	3	73	2010.00						
	4	73	2070.00	8	3020.00	23	1620.00		
	5	73	1520.00	6	1110.00	26	2080.00		
	6	73	1050.00	9	1400.00				
	7	73	565.00	10	733.00				
	8	73	217.00	3	296.00	31	170.00		
	9	73	214.00	29	252.00				
	10	73	208.00						

LAKE CODE 3634 SCHROON LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
363401	11	72	13.90	5	57.10				
	12	72	1.00	3	28.20				
	1	73	17.50	7	38.00				
	2	73	15.90	25	12.00				
	3	73	42.60						
	4	73	44.60	8	41.00	23	63.00		
	5	73	27.30	6	25.50	26	34.00		
	6	73	12.40	9	16.70				
	7	73	8.43	10	9.90				
	8	73	3.14	3	9.60	31	1.70		
	9	73	3.66						
	10	73	2.26						
3634E1	11	72	3.96	5	15.80				
	12	72	3.10	3	7.80				
	1	73	4.98	7	10.50				
	2	73	4.52	25	3.40				
	3	73	12.10						
	4	73	12.60	8	9.15	23	14.20		
	5	73	7.75	6	5.75	26	7.60		
	6	73	3.53	9	3.70				
	7	73	2.40	10	2.08				
	8	73	0.90	3	1.62	31	0.30		
	9	73	1.05						
	10	73	0.64						
3634F1	11	72	3.96	5	17.60				
	12	72	3.10	3	8.75				
	1	73	4.98	7	11.70				
	2	73	4.52	25	3.80				
	3	73	12.10						
	4	73	12.60	8	9.60	23	16.80		
	5	73	7.75	6	5.28	26	7.56		
	6	73	3.53	9	2.80				
	7	73	2.40	10	0.80				
	8	73	0.90	3	1.46	31	0.21		
	9	73	1.05						
	10	73	0.64						
363401	11	72	39.40	5	145.00				
	12	72	31.10	3	71.20				
	1	73	49.60	7	96.00				
	2	73	45.10	25	30.20				
	3	73	121.00						
	4	73	126.00	8	122.00	23	218.00		
	5	73	77.10	6	64.00	26	94.00		
	6	73	35.20	9	41.50				
	7	73	23.90	10	21.80				
	8	73	8.94	3	26.20	31	6.70		
	9	73	10.40						
	10	73	6.46						

TRIBUTARY FLOW INFORMATION FOR NEW YORK 11/26/74

LAKE CODE 3634 SCHROON LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
3634ZZ	11	72	352.00	5	678.00				
	12	72	278.00	3	336.00				
	1	73	442.00	7	450.00				
	2	73	402.00	25	144.00				
	3	73	1080.00						
	4	73	130.00	8	1140.00	23	2060.00		
	5	73	689.00	6	568.00	26	865.00		
	6	73	315.00	9	364.00				
	7	73	213.00	10	178.00				
	8	73	80.10	3	244.00	31	79.30		
	9	73	92.70						
	10	73	57.40						

APPENDIX B

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 74/11/26

363401
43 45 48.0 073 45 48.0
SCHROON LAKE
36 NEW YORK

11EPALES
3

2111202
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/01	17	35 0000	18.8	9.0	118	30	6.70	10	0.140	0.010K	0.003	0.002
	17	35 0010	17.9	9.4		50	7.00	11	J.140	0.010	0.003	0.003
	17	35 0037	5.5	10.9		50	6.90	10K	0.200	0.010	0.004	0.002
72/07/25	16	40 0000			140	55	7.50	15	0.090	0.050	0.007	0.004
	16	40 0004	25.0	8.2		55	7.50	14	0.100	0.050	0.007	0.006
	16	40 0015	21.9	8.4		50K	7.30	13	0.120	0.060	0.007	0.006
	16	40 0025	11.2	9.2		50K	7.20	11	0.180	0.060	0.006	0.004
	16	40 0035	7.2			50K	7.20	10	0.220	0.060	0.005	0.004
72/10/10	15	30 0000			180	60	7.10	10	0.080	0.040	0.004	0.004
	15	30 0004	13.4	9.0		60	7.10	11	0.090	0.070	0.004	0.004
	15	30 0015	13.5	9.0		59	7.10	11	0.080	0.040	0.004	0.003
	15	30 0030	11.0	7.6		59	7.10	10K	0.170	0.050	0.004	0.003
	15	30 0041	7.8	7.1		57	6.65	10K	0.220	0.030	0.007	0.003

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/01	17	35 0000	1.9J
72/07/25	16	40 0000	1.8J
72/10/10	15	30 0000	2.1J

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

363402
43 49 54.0 073 47 00.0
SCHROON LAKE
36 NEW YORK

11EPALES 2111202
3 0040 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/01	18	20 0000	17.7	9.5	132	30	6.60	10K	0.160	0.020	0.002	0.002K
	18	20 0010	16.0	10.0		30	6.60	10K	0.160	0.030	0.004	0.002K
	18	20 0032	5.4	11.2		20	6.90	10	0.180	0.010	0.002	0.002
72/07/25	17	15 0000			144	55	7.50	10K	0.090	0.060	0.006	0.005
	17	15 0004	25.6	8.4		55	7.50	15	0.080	0.030	0.006	0.005
	17	15 0014	21.0	8.8		55	7.50	14	0.110	0.060	0.007	0.004
72/10/10	16	00 0000			168	59	7.20	10	0.090	0.050	0.006	0.005
	16	00 0004	13.8	9.1		58	7.15	11	0.080	0.040	0.003	0.001
	16	00 0015	13.7	9.1		58	7.10	10K	0.140	0.040	0.003	0.001
	16	00 0024	13.3	9.1		59	7.10	10	0.080	0.050	0.003	0.003

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/01	18	20 0000	1.9J
72/07/25	17	15 0000	2.9J
72/10/10	16	00 0000	1.9J

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

APPENDIX C

TRIBUTARY DATA

STORET RETRIEVAL DATE 74/11/26

3634A1 LS3634A1
43 52 30.0 073 44 30.0
SCHROON RIVER
36 15 PARADOX LAKE
I/SCHROON LAKE
ST HWY 73 CULVERT
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11 45		0.030	0.230	0.039	0.005K	0.006
72/12/03			0.033	0.210	0.011	0.005K	0.005K
73/01/07			0.231	0.170	0.026	0.005K	0.005K
73/02/25			0.028	1.320	0.110	0.007	0.020
73/04/08			0.100	2.100	0.200	0.005K	0.005K
73/04/23			0.056	1.200	0.040	0.005K	0.005K
73/05/06			0.031	1.400	0.038		0.015
73/05/26			0.044	2.600	0.024	0.010	0.015
73/06/04			0.069	0.300	0.018	0.008	0.015
73/07/10			0.010K	0.830	0.033	0.005K	0.005K
73/08/03			0.134	0.810	0.008	0.005K	0.020
73/08/31			0.016	2.400	0.069	0.005K	0.005K
73/09/29			0.021	0.100K	0.036	0.005K	0.010

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3634A2 LS3634A2
43 43 00.0 073 48 30.0
SCHROON RIVER
36 15 NORTH CREEK
O/SCHROON LAKE
ALONG BANK FROM LGT DUTY RD
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	10 30		0.140	0.600	0.160	0.006	0.039
73/02/25			0.018	0.540	0.026	0.005K	0.005K
73/04/08			0.210	4.000	0.160	0.005K	0.010
73/04/23			0.074	0.910	0.021	0.005K	0.015
73/05/06			0.060	0.920	0.157	0.012	0.030
73/05/26			0.056	1.890	0.068	0.005K	0.055
73/06/09			0.067	0.460	0.031	0.020	0.035
73/07/10			0.018	1.050	0.075	0.008	0.025
73/08/03			0.063	0.400	0.032	0.005K	0.025
73/08/31			0.294	2.000	0.100		
73/09/29			0.019	0.340	0.058	0.005K	0.015

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

363481 LS363481
43 52 30.0 073 44 00.0
UNNAMED BROOK
36 15 PARADOX LAKE
T/SCHROON LAKE
ST HWY 73 BRDG
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11	35	0.240	0.240	0.035	0.005K	0.007
72/12/03			0.176	0.230	0.016	0.005K	0.005K
73/01/07			0.058	0.170	0.019	0.005K	0.010
73/01/27			0.240	0.250	0.040	0.011	0.011
73/02/25			0.010K	0.160	0.016	0.005K	0.005K
73/04/08			0.231	0.100	0.230	0.005K	0.015
73/04/23			0.340	1.150	0.027	0.005K	0.005K
73/05/08			0.240	0.450	0.020	0.005K	0.015
73/05/24			0.046	0.560	0.013	0.005K	0.090
73/06/09			0.066	0.320	0.013	0.006	0.015
73/07/10			0.115	0.750	0.029	0.005K	0.010
73/08/03			0.138	1.100	0.340	0.005K	0.019
73/08/31			0.130	1.760	0.052	0.007	0.015
73/09/29			0.115	0.500	0.115	0.005K	0.015

25

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3634C1 LS3634C1
43 51 30.0 073 43 30.0
ALDER CREEK
36 15 PARADOX LAKE
T/SCHROON LAKE
BRDG S OF OWLS HEAD MTN
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11 30		0.052	0.310	0.048	0.005K	0.012
72/12/03			0.048	0.210	0.005K	0.005K	0.005K
73/01/27			0.045	0.190	0.020	0.006	0.006
73/04/04			0.054	2.200	0.176	0.005K	0.005K
73/04/23			0.020	0.660	0.021	0.005K	0.005K
73/05/06			0.030	0.600	0.021	0.005K	0.015
73/05/26			0.048	1.400	0.020	0.005K	0.015
73/06/09			0.066	0.420	0.022	0.006	0.015
73/07/10			0.033	0.560	0.022	0.006	0.017
73/08/03			0.080	0.630	0.080	0.005K	0.030
73/09/31			0.025	0.230	0.038	0.006	0.015
73/09/29			0.021	0.295	0.033	0.005K	0.010

K VALUE [illegible] TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

363401 LS363401
43 50 00.0 073 45 30.0
ROGERS BROOK
36 15 SCHROON LAKE
T/SCHROON LAKE
FROM BANK IN SCHROON LAKE BELO STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05			0.085	0.360	0.096	0.005K	0.013
72/12/03			0.140	0.290	0.016	0.006	0.006
73/01/07			0.198	0.240	0.025	0.005K	0.010
73/01/27			0.290	0.250	0.035	0.007	0.015
73/02/25			0.010K	0.130	0.018	0.005K	0.007
73/04/08			0.198	1.760	0.147	0.005K	0.010
73/04/23			0.138	1.260	0.029	0.007	0.025
73/05/06			0.066	1.100	0.026	0.006	0.025
73/05/26			0.058	1.890	0.037	0.012	0.050
73/06/09			0.066	0.460	0.030	0.006	0.015
73/07/10			0.130	0.530	0.022	0.006	0.020
73/09/03			0.052	0.500	0.154	0.005K	0.010
73/09/31			0.320	1.320	0.555	0.006	0.055
73/09/24			0.110	0.520	0.053	0.005K	0.010

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

363402 LS363402
43 50 00.0 073 46 30.0
ROGERS BROOK
36 15 SCHROON LAKE
T/SCHROON LAKE
BROG .5 MI W OF SCHROON LAKE AROV STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05			0.052	0.390	0.044	0.005K	0.011
73/01/07			0.170	0.220	0.028	0.005K	0.010
73/02/25			0.016	0.110	0.021	0.005K	0.005K
73/04/09			0.198	2.900	0.160	0.005K	0.005K
73/04/23			0.134	1.540	0.034	0.005K	0.005K
73/05/06			0.054	1.320	0.054	0.005K	0.010
73/05/20			0.052	2.400	0.033	0.010	
73/06/09			0.066	0.400	0.015	0.005K	0.015
73/07/10			0.110	0.680	0.026	0.006	0.015
73/09/03			0.028	0.600	0.032	0.005K	0.030
73/09/31			0.378	0.540	0.046	0.010	0.050
73/09/29			0.058	0.860	0.067	0.005K	0.010

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3634E1 LS3634F1
43 50 00.0 073 46 30.0
HORSESHOE POND BROOK
36 15 SCHROON LAKE
T/SCHROON LAKE
US HWY 9 BRDG IN SCHROON LAKE
11EPALFS 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11	15	0.110	0.360	0.065	0.005K	0.017
72/12/03			0.147	0.280	0.013	0.006	0.009
73/01/07			0.094	0.190	0.018	0.005K	0.005K
73/01/27			0.110	0.210	0.025	0.007	0.007
73/02/25			0.017	0.400	0.029	0.009	
73/04/08			0.042	2.400	0.200	0.005K	0.005K
73/04/23			0.034	0.700	0.019	0.005K	0.005K
73/05/06			0.032	0.630	0.037	0.005K	0.010
73/05/24			0.044	0.520	0.035	0.006	
73/06/09			0.064	0.380	0.016	0.007	0.020
73/07/10			0.115	0.570	0.056	0.005K	0.010
73/08/03			0.088	0.750	0.110	0.005K	0.015
73/08/31			0.220	2.600	0.900	0.006	0.035
73/09/29			0.080	0.920	0.790	0.005K	0.005K

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3634F1 LS3634F1
43 46 30.0 073 47 30.0
UNNAMED BROOK
36 15 SCHROON LAKE
T/SCHROON LAKE
RD BRDG JOINING US HWY 9
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11	25	0.067	0.240	0.048	0.005K	0.011
72/12/01			0.069	0.250	0.022	0.005K	0.005K
73/01/07			0.077	0.270	0.058	0.005K	0.005K
73/01/27			0.069	1.500	0.150	0.006	0.010
73/02/25			0.015	0.560	0.042	0.005K	0.005K
73/04/08			0.036	1.760	0.105	0.005K	0.010
73/04/21			0.074		0.072	0.005K	0.010
73/05/06			0.039	1.200	0.027	0.005K	0.020
73/05/26			0.048	0.260	0.008	0.006	0.010
73/06/09			0.063	0.360	0.018	0.005K	0.015
73/07/10			0.138	0.770	0.046	0.006	0.013
73/08/01			0.078	1.050	0.330	0.005K	0.015
73/08/31			0.198	1.095	0.126	0.005K	0.010
73/09/24			0.043	0.520	0.115	0.005K	0.005K

K VALUE KNOWN TO BE LESS THAN INDICATED

30

STORET RETRIEVAL DATE 74/11/26

3634G1 LS3634G1
43 46 00.0 073 45 30.0
MILL BROOK
36 15 SCHROON LAKE
T/SCHROON LAKE
BRDG IN ADIRONDACK
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	10 45		0.060	0.440	0.063	0.005K	0.010
72/12/03			J.048	0.150	0.009	0.005K	0.015
73/01/07			0.084	0.240	0.037	0.005K	0.005K
73/01/27			0.078	0.180	0.028	0.005K	0.010
73/04/08			0.052	4.100	0.252	0.005K	0.015
73/04/23			0.052	3.500	0.132	0.005K	0.005K
73/05/06			0.115	1.000	0.020	0.005K	0.010
73/05/26			0.052	1.800	0.037	0.006	
73/06/09			0.063	0.430	0.012	0.005K	0.015
73/07/10			0.078	1.050	0.044	0.005K	0.020
73/08/03			0.078	1.700	0.330	0.005K	0.030
73/08/31			0.054	0.260	0.009	0.005K	0.015
73/09/29			0.050	1.100	0.027	0.005K	0.005K

< VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3634H1 LS3634H1
43 43 30.0 073 49 30.0
TROUT BROOK
36 15 NORTH CREEK
T/SCHROON LAKE
US HWY 9 BRDG
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	10	35	0.211	0.340	0.058	0.005K	0.007
72/12/03			0.190	0.240	0.008	0.005K	0.006
73/01/07			0.189	0.300	0.058	0.005K	0.010
73/04/08			0.260	3.020	0.430	0.005K	0.010
73/04/23			0.210	1.050	0.030	0.005K	0.010
73/05/06			0.126	1.150	0.034	0.005K	0.015
73/05/26			0.052	0.940	0.017	0.005K	0.025
73/06/09			0.068	1.470	0.031	0.005K	0.020
73/07/10			0.066	0.800	0.044	0.005K	0.015
73/08/31			0.180	1.260	0.240	0.005K	0.015
73/09/29			0.075	0.460	0.024	0.005K	0.025

K VALUE KNOWN TO BE LESS THAN INDICATED